



SPECIAL  
MATERIALS  
POWER  
GENERATION

# MATERIALS FOR POWER GENERATION

# INNOVATION IS THE POWER FOR HIGH PERFORMANCE

As an energy production company you demand the highest standards from our steels. That makes us partners in performance. The high-end field in particular is where we can show our advantage in technology at its best; where we can put forward our metallurgical know-how and highlight our 120 years of experience. It is precisely these demands that inspire us to carry on research and constantly improve the properties of our steels.

Your interests and our will to continuous development, has made us the clear-cut number one in the world of melting and remelting technology. We are well aware that this market position is not something we should ever take for granted. It is a daily reminder for the best minds working under the best production conditions in revolutionary production facilities to go beyond the confines of what is feasible.

Meeting the energy of the society in which we live is a challenge we face up to on a daily basis. Economically and ecologically. It's a challenge we would like to take up with you at our side.



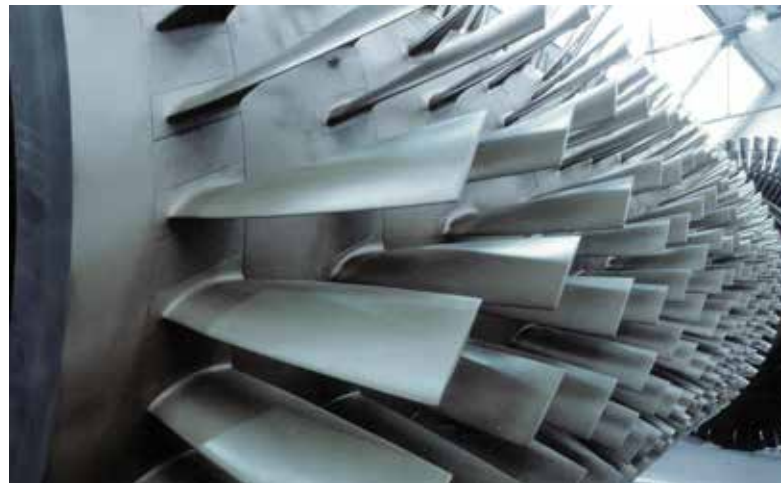




# TRENDSETTING INNOVATIONS FOR METALLURGICAL TOP PERFORMANCE

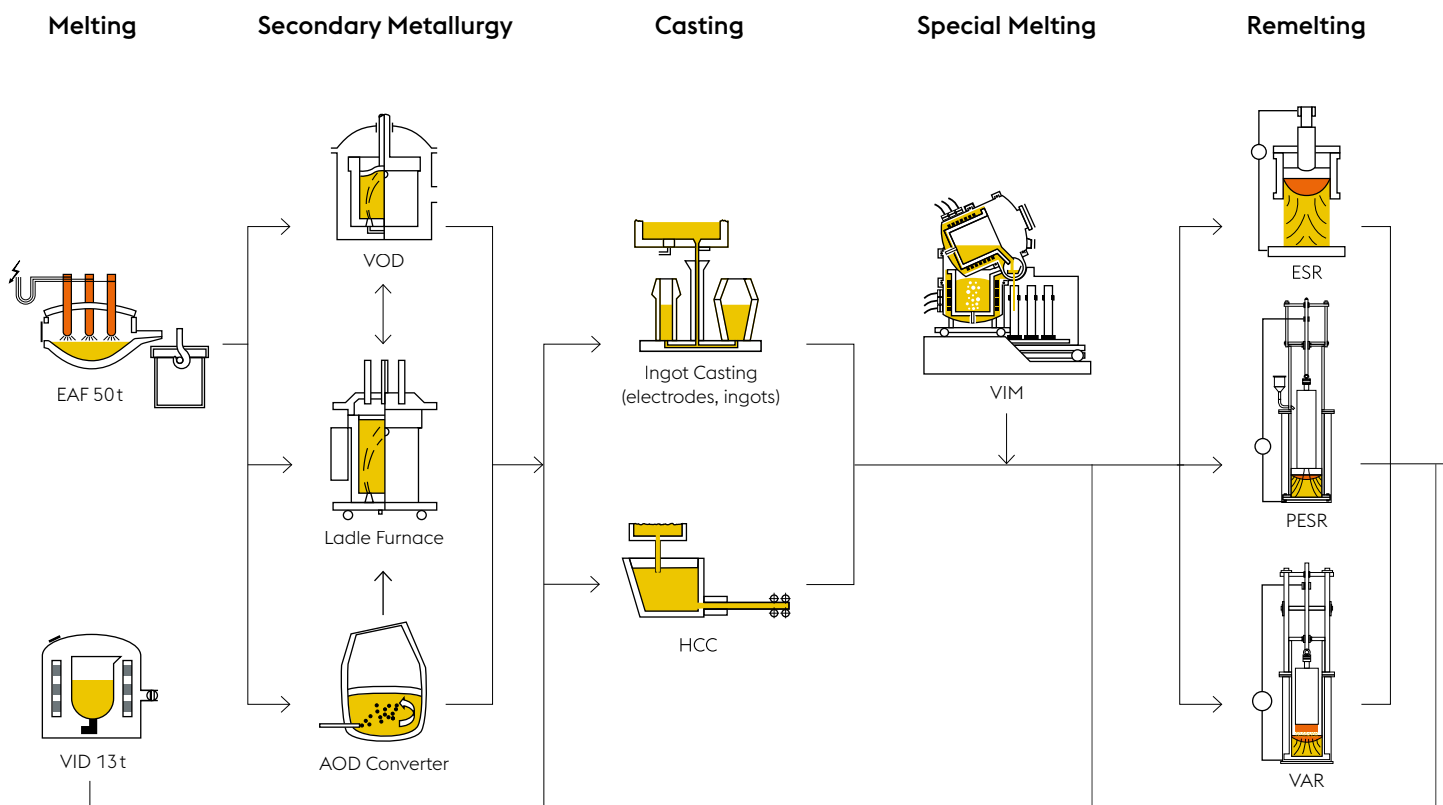
Are you looking for a more efficient and safer way to generate energy? The solution is just as simple to define as it is difficult to find: you need materials of the highest possible metallurgical purity to meet the most diverse demands of the processing properties.

This is something we guarantee by having a maximum of production options available. We offer the full range of melting and remelting technologies in the world today under one roof. Depending on the demands to be made on the steel, we produce in a vacuum (VIM, VAR) or in an electrode block in a slag bath, with or without pressure (ESR, PESR). This varied range has helped us to become one of the principal manufacturers of special steels worldwide.

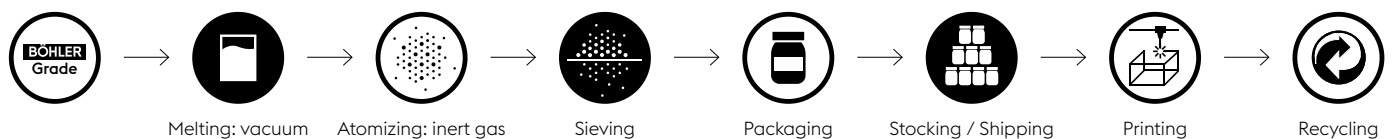


# TRENDSETTING TECHNOLOGIES FOR METALLURGICAL TOP PERFORMANCE

## FLOW OF MATERIAL



## AMPO





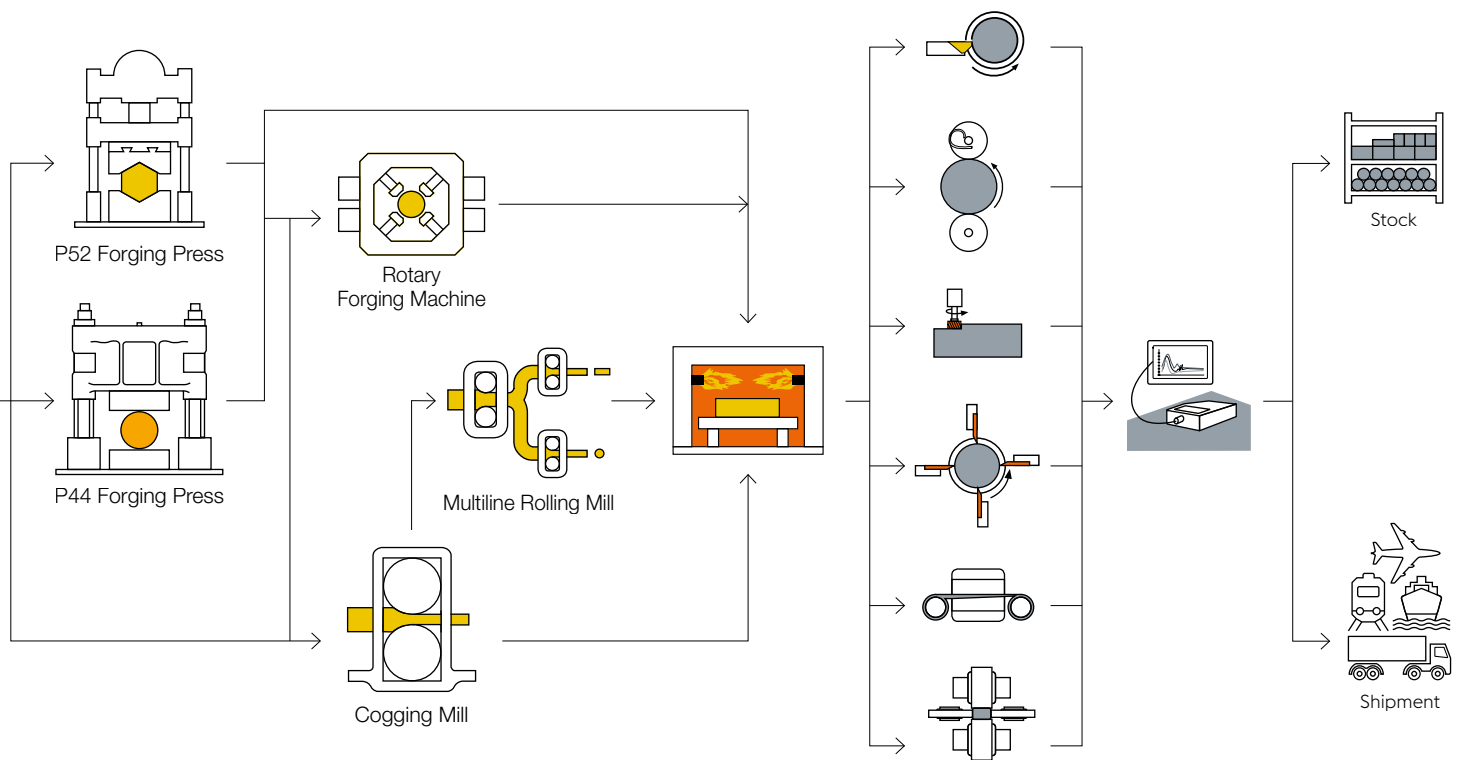
**Rolling and Forging**

**Heat Treatment**

**Machining**

**Testing**

**Dispatch**



# OUR AGGREGATES ARE THE CRADLE OF YOUR SUCCESS

Our **5200 ton press** with its integrated manipulator for handling unit weights of **up to 40 tons** is the **cradle of optimum primary material for your products**.

**Unless of course you need forged bars and semi-finished products. Then our new rotary forging machine will be the source of bar steel you need up to a length of 15 m and diameters of up to 550 mm.** All with a unit weight of 8 tons! Insiders already know that these facts and data mean that we have yet again set the benchmark all over the world with our one-of-a-kind production line: re-defining once more the dimensions of this field.

## A MAXIMUM FORGING FORCE OF 2000 TONS.

Powerful manipulators quickly move the bars or billets during the forging process towards the highest quality and precision. The maximum forging force is 2000 tons.

## TWO FURNACE LINES FOR TWICE THE SAFETY AND QUALITY

In order for tool steels and special materials, as are needed in the oil and gas industries, to be able to be produced with the exact temperature profile specified and required we have two separate furnace lines in operation at the same time. **The result: extremely short transfer times, more quality, more safety.**

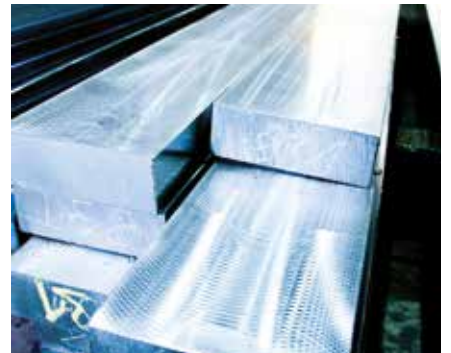






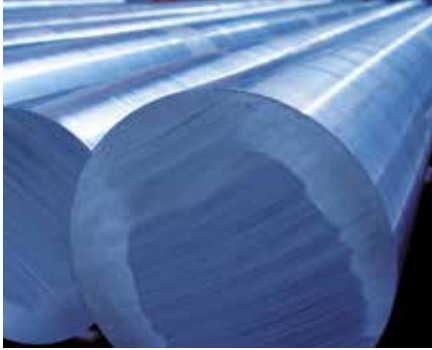


Bar steel ground with bevelled ends

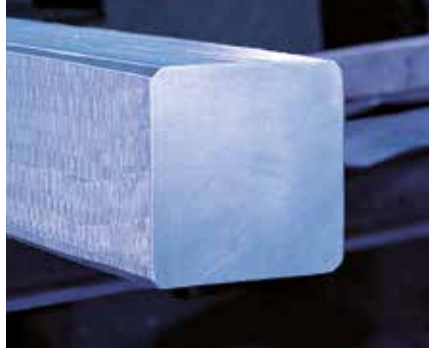


Flat steel milled

THE QUALITY OF  
YOUR COMPONENTS  
STARTS HERE



Bar – peeled + ground



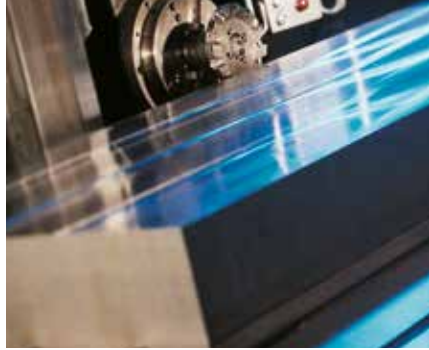
Forged billets, bright ground



Bar – peeled – polished



Bright steel – peeled – polished



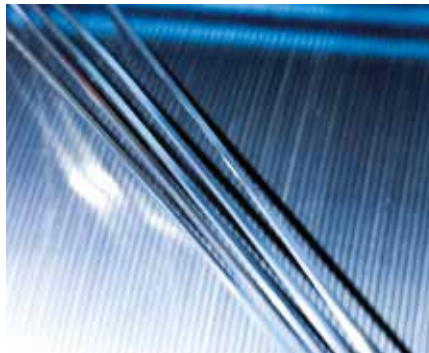
Block sawn + milled



Flat steel



Flat steel – precision ground



Precision flat wire



Wire / rolled

### Cross sections of round billets

Surface ground to remove defects  
 or bright ground 100 – 1200 mm (3.94 – 47.24")  
 with peeled surface 100 – 425 mm (3.94 – 16.73")  
 with turned surface 425 – 900 mm (16.73 – 35.43")

### Cross sections of square billets

Surface bright ground 100 – 600 mm (3.94 – 23.62")

### BAR rolled

round: 12,5 – 150 mm (0.49 – 5.91")  
 square: 15 – 150 mm (0.59 – 5.91")  
 flat: width, mm (inch) thickness, mm (inch)  
 15 – 60 (0.59 – 2.36) 5 – 41 (0.20 – 1.61)  
 60 – 200 (2.36 – 7.87) 5 – 86 (0.20 – 3.39)  
 100 – 300 (3.94 – 11.81) 15 – 80 (0.59 – 3.15)

### ROLLED WIRE

rolled: dia. 5,0 – 13,5 mm (0.20 – 0,53")  
 drawn: dia. 1,0 – 12,0 mm (0.04 – 0,47")

### BAR forged

round: 110 – 1200 mm (4.33 – 47.24")  
 square: 90 – 1200 mm (3.54 – 47.24")  
 flat: width, mm (inch) thickness, mm (inch)  
 120 (4.72) 50 (1.97) min.  
 1600 (62.99) 1000 (39.37) max.

Ratio width/thickness maximum 10:1

### BAR pre-machined

IBO ECOMAX: 12,5 – 425 mm (0.49 – 16.73")

### BRIGHT STEEL

ECOBANK peeled and polished  
 ECOFINISH band ground  
 BRIGHT BAR ground and polished

### Open die forgings

premachined or ready machined according to customer requirements, up to 45 tons.

# YOUR MATERIALS FOR POWER GENERATION

You tell us the specification and standards – we deliver the perfect materials for your needs. Following is an overview of our materials for the energy machinery.

## 12% Cr

BÖHLER grade	Market grade	Melting route	UNS	ASTM	Others	Products and size range
<b>BÖHLER</b> T655SC	-	Airmelted Airmelt + ESR	1.4006	403	X12 Cr 13	Round bar, flat bar, billet
<b>BÖHLER</b> T656	-	Airmelt + ESR	-	403Cb	-	Round bar, flat bar, billet
<b>BÖHLER</b> T651	X20	Airmelted	1.4021	420	X20 Cr 13	Round bar, flat bar, billet

## 12% CrMo

BÖHLER grade	Market grade	Melting route	UNS	ASTM	Others	Products and size range
<b>BÖHLER</b> T602	-	Airmelted	1.4120 1.4921	-	X20 CrMo 13 X19 CrMo 12-1	Round bar, flat bar, billet
<b>BÖHLER</b> T659	-	Airmelted	-	-	X5 CrMoAl 12	Round bar, flat bar, billet
<b>BÖHLER</b> T608SA	-	Airmelted + ESR	-	-	X11 CrMo 12-1 X15 CrMo 13	Round bar, flat bar, billet

## 12% CrMoV

BÖHLER grade	Market grade	Melting route	UNS	ASTM	Others	Products and size range
<b>BÖHLER</b> T550	X22	Airmelted	1.4922	-	X20 CrMoV 12-1	Round bar, flat bar, billet
<b>BÖHLER</b> T550SA	ST12T ST12TE	Airmelted + ESR	1.4923	-	X22 CrMoV 12-1 ST12TE	
<b>BÖHLER</b> T560SB	-	Airmelted + ESR	-	403Cb+	-	Round bar, flat bar, billet
<b>BÖHLER</b> T560	X19	Airmelted Airmelted + ESR	1.4913	-	X19 CrMoVNbN 11-1	Round bar, flat bar, billet

## 12% CrMoV(W)

BÖHLER grade	Market grade	Melting route	UNS	ASTM	Others	Products and size range
<b>BÖHLER</b> T504	-	Airmelted Airmelted + ESR	-	422 / 616	-	Round bar, flat bar, billet
<b>BÖHLER</b> T505SA	AJ	Airmelted + ESR	-	-	-	Round bar, flat bar, billet
<b>BÖHLER</b> T505SC	X12	Airmelted + ESR	1.4906	-	X12 CrMoWVNbN 10-1-1	Round bar, flat bar, billet
<b>BÖHLER</b> T552	Jethete M152	Airmelted Airmelted + ESR	1.4933 1.4938 1.4939	XM-32	X12 CrNiMoV 12-2	Round bar, flat bar, billet

## Martensitics (PH-Grades)

BÖHLER grade	Market grade	Melting route	UNS	ASTM	Others	Products and size range
<b>BÖHLER</b> T670	14-5 PH	Airmelted Airmelted + ESR	1.4594	-	X5 CrNiMoCuNb 14-5	Round bar, flat bar, billet
<b>BÖHLER</b> T671SA <b>BÖHLER</b> T671SB	Custom 450	Airmelted + ESR	-	XM-16	-	Round bar, flat bar, billet
<b>BÖHLER</b> N700	17-4 PH	Airmelted + ESR	1.4542 1.4548	630	X5 CrNiCuNb 17-4	Round bar, flat bar, billet
<b>BÖHLER</b> N701SD	15-5 PH	Airmelted + ESR	1.4545	XM-12	X5 CrNiCuNb 15-5	Round bar, flat bar, billet

## Soft Martensitics

BÖHLER grade	Market grade	Melting route	UNS	ASTM	Others	Products and size range
<b>BÖHLER</b> N400	F6NM	Airmelted	1.4313	-	X3 CrNiMo 13-4	Round bar, flat bar, billet
<b>BÖHLER</b> N400SD	F6NM	Airmelted	1.4313	-	X3 CrNiMo 13-4	Round bar, flat bar, billet
<b>BÖHLER</b> N403	F6NM	Airmelted	1.4313	-	X3 CrNiMo 13-4	Round bar, flat bar, billet
<b>BÖHLER</b> N404	-	Airmelted	1.4418	-	X4 CrNiMo 16-5-1	Round bar, flat bar, billet

## CrMoV

BÖHLER grade	Market grade	Melting route	UNS	ASTM	Others	Products and size range
<b>BÖHLER</b> D230	-	Airmelted	1.7709	-	21 CrMoV 5-7	Round bar, flat bar, billet

## CrNiMo

BÖHLER grade	Market grade	Melting route	UNS	ASTM	Others	Products and size range
<b>BÖHLER</b> V120	-	Airmelted	1.6772	-	20 NiCrMo 14-5	Round bar
<b>BÖHLER</b> V158	-	Airmelted	1.6957	-	26 NiCrMoV 14-5	Round bar, flat bar, billet

## Austenitic

BÖHLER grade	Market grade	Melting route	UNS	ASTM	Others	Products and size range
<b>BÖHLER</b> T200	A286	Airmelted + ESR	1.3980 1.4944 1.4980	660	X6 NiCrTiMoVB 25-15-2	Round bar, flat bar, billet
<b>BÖHLER</b> T240	ST17/13W	Airmelted	-	-	-	Flat bar, billet
<b>BÖHLER</b> T262	-	Airmelted	1.4986	-	X7 CrNiMoBNb 16-16	Round bar, billet

## Ni-Superalloys

BÖHLER grade	Market grade	Melting route	UNS	ASTM	Others	Products and size range
<b>BÖHLER</b> L080	Alloy 080A HT	VIM + VAR	2.4952	-	NiCr20TiAl	Round bar
<b>BÖHLER</b> L901	Alloy 901	VIM + VAR	2.4662	-	NiCr13Mo6Ti3	Round bar
<b>BÖHLER</b> L263	Alloy 263	VIM + ESR	2.4650	-	NiCo20Cr20MoTi	Round bar
<b>BÖHLER</b> L718	Alloy 718	VIM + VAR	2.4668	-	NiCr19NbMo	Round bar



# RESEARCH AND DEVELOPMENT

## THE BEST TEST RESULTS

The voestalpine BÖHLER testing laboratory has been accredited by the performance review institute ISO 17025 and NADCAP to conduct tests for the zero tolerance field of aviation as well. This means that all of the mechanical-technological and metallographical tests carried out not only meet the simulated demands of reality but exceed them beyond expectations!

# FORMS OF SUPPLY AND AVAILABILITY

## PROMPT AVAILABILITY

Having a professional partner is vital, especially in the field of power industry engineering. In order to be able to fulfill the demands of our customers in terms of time and quantity, we are able to offer special storage options at several locations.

### Austria:

**Production Company and Central Stock**  
**voestalpine BÖHLER Edelstahl GmbH & Co KG**  
Mariazeller Straße 25, 8605 Kapfenberg, Austria  
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**voestalpine**

ONE STEP AHEAD.